FEDERAL PUBLIC SERVICE COMMISSION

COMPETITIVE EXAMINATION-2024 FOR RECRUITMENT

TO POSTS IN BS-17 UNDER THE FEDERAL GOVERNMENT

Roll Number

BOTANY

TIME ALLOWED: THREE HOURS **PART-I(MCQS): MAXIMUM 30 MINUTES**	**PART-I (MCQS) MAXIMUM MARKS = 20** **PART-II MAXIMUM MARKS = 80**

NOTE: (i) **Part-II** is to be attempted on the separate **Answer Book.**

(ii) Attempt **ONLY FOUR** questions from **PART-II. ALL** questions carry **EQUAL** marks.

(iii) All the parts (if any) of each Question must be attempted at one place instead of at different places.

(iv) Candidate must write Q. No. in the Answer Book in accordance with Q. No. in the Q. Paper.

(v) No Page/Space be left blank between the answers. All the blank pages of Answer Book must be crossed.

(vi) Extra attempt of any question or any part of the attempted question will not be considered.

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TIME ALLOWED: THREE HOURS	(PART-I MCQs)	MAXIMUM MARKS: 20
PART-I (MCQs) : MAXIMUM 30 MINUTES	(PART-II)	MAXIMUM MARKS: 80

NOTE: (i) First attempt **PART-I (MCQs)** on separate **OMR Answer Sheet** which shall be taken back after **30 minutes.**
(ii) **Overwriting/cutting of the options/answers will not be given credit.**
(iii) There is **no negative** marking. All MCQs must be attempted.

PART-I (MCQs)(COMPULSORY)

Q.1. (i) Select the best option/answer and fill in the appropriate Box ■ on the **OMR Answer Sheet.(20x1=20)**
(ii) Answers given anywhere else, other than OMR Answer Sheet, will not be considered.

1. **What is the largest plant family in the world, known for its diverse members such as sunflowers, daisies and chrysanthemums?**
(A) Poaceae (B) Asteraceae (C) Fabaceae (D) Rosaceae
2. **In Pakistan, which of the following is a common type of gymnosperm?**
(A) Oak tree (B) Pine tree (C) Maple tree (D) Willow tree
3. **Organisms that obtain energy by absorbing and metabolizing nutrients are:**
(A) Heterotrophs (B) Auxotrophs (C) Osmotrophs (D) Phototrophs
4. **Pattern of arrangement of leaves on stem is called:**
(A) Stipule (B) Adaxial (C) Abaxial (D) Phyllotaxy
5. **How many enzymes are involved in Krebs cycle?**
(A) Four (B) Six (C) Eight (D) Ten
6. **The enzymes of glycolysis are located in the:**
(A) Cytoplasm (B) Nucleus (C) Lysosomes (D) Mitochondrion
7. **Thioredoxin widely occurs in plants is:**
(A) Lipid in nature (B) Carbohydrate in nature (C) Protein in nature (D) None of them
8. **Auxin is synthesized directly from the Amino acid:**
(A) Proline (B) Cystein (C) Tryptophan (D) Glycine
9. **Triticale is derived by crossing:**
(A) Wheat and Rice (B) Wheat and tapioca (C) Rye and Wheat (D) Rye and Rice
10. **Which of the following metabolites are implicated in stress tolerance?**
(A) Proline (B)Betaines (C) Citrate (D) Both (A) and (B)
11. **The first transgenic plants expressing engineered foreign genes were tobacco plants produced by the use of:**
(A) Agrobacterium tumefaciens (B) Bacillus thuringiensis
(C) Arabidopsis thaliana (D) Streptomyces hygroscopicus
12. **The most effective temperature range for vernalization is:**
(A) 1-5 °C (B) 1-3 °C (C) 1-7 °C (D) 4-11°C
13. **What is the most economically important mushroom in Swat, Pakistan?**
(A) Shiitake (B) Oyster (C) Morel (D) Button
14. **What is the botanical name of chia seeds?**
(A) Cicer arietinum (B) Salvia hispanica (C) Linum usitatissimum (D) Sesamum indicum
15. **In addition to its culinary and medicinal uses, fennel has been historically believed to possess which of the following properties?**
(A) Aphrodisiac (B) Hypnotic (C) Anticoagulant (D) Antiseptic
16. **_____ is a superior source of protein with all nine essential amino acids.**
(A) Blueberries (B) Quinoa (C) Avocado (D) Broccoli
17. **In the photosynthetic electron transport chain, which photosystem has a higher energy level and functions first in capturing light energy?**
(A) Photosystem I (PSI) (B) Photosystem II (PSII)
(C) Both have equal energy levels (D) Neither has a distinct energy level
18. **What is the function of DNA helicase during DNA replication?**
(A) Joins Okazaki fragments (B) Unwinds and separates the DNA strands
(C) Synthesizes new DNA strands (D) Proofreads DNA for errors
19. **Where does transcription, the first step in protein synthesis, occur in eukaryotic cells?**
(A) Ribosome (B) Nucleus (C) Cytoplasm (D) Mitochondria
20. **Which type of evolution results in the development of similar traits in unrelated species due to adaptation to similar environmental challenges?**
(A) Convergent evolution (B) Divergent evolution (C) Parallel evolution (D) Adaptive evolution

PART-II

Q2. Evaluate the potential advantages and challenges of using algae for biofuel production, taking into account environmental and economic factors.

Q3. Explain the ecological importance of gymnosperms. How do they contribute to biodiversity and ecosystem functions?

Q4. Compare and contrast the advantages and disadvantages of using plant tissue culture techniques compared to traditional methods of plant propagation.

Q5. Discuss the principles and methodologies used in biosystematics for the classification and identification of plant species.

Q6. Provide a labeled diagram of the Krebs cycle in plants, highlighting key intermediates and enzymes involved. Explain the significance of each step in the cycle.

Q7. Analyze the role of plants in phytoremediation. Discuss how certain plant species can help mitigate soil pollution by absorbing and detoxifying contaminants.

Q8. Briefly describe any two of the following:

Role of Cytokinin in plant senescence

Parthenogenesis vs Apomixis

Hardy-Weinberg's Theorem